

Multi-Use Non-Intrusive Flow Characterization System (FCS), Phase I

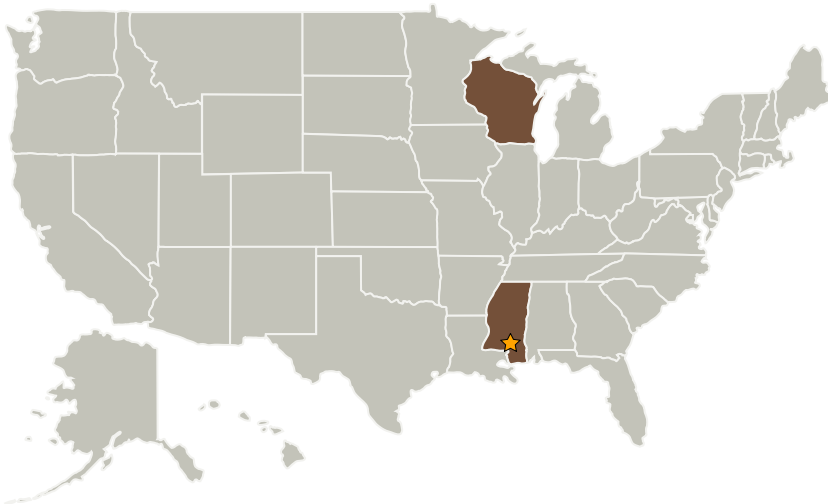


Completed Technology Project (2004 - 2004)

Project Introduction

The innovation is a Multi-Use Non-Intrusive Flow Characterization System (FCS) for densified, normal boiling point, and two-phase cryogenic flows, capable of accurately measuring several fluid parameters in real-time. Cryogenic fluids are ubiquitous in the aerospace industry. Their low temperatures inherently promote heat transfer from the ambient environment which often results in two-phase flows that cannot be adequately characterized by existing instrumentation. FCS was originated to address this issue and greatly enhance the quantification, reliability, safety, and autonomous operations of propulsion test operations. FCS handles both transient and steady state flows, and is anticipated to have a fast response time. The technology can non-intrusively operate in the following five modes: 1) on-line analysis of fluid mixtures; 2) mass flow rate measurement; 3) temperature measurement; 4) fluid conditioning and health monitoring; and 5) model validation for a cryogenic or non-cryogenic fluid flow. Phase I has been structured to provide design, analytical, experimental, and data analysis groundwork toward the successful development of the proposed technology, including the characterization of high pressure LOX flows. The Phase II program will produce a prototype commercial FCS System for delivery to NASA Stennis Space Center, and use at several other NASA centers and commercial facilities.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations

Mississippi	Wisconsin
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Daniel Gramer

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.8 Measurement and Control